

Amendment
Application No. 10/604,826
Attorney Docket No. 031009

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

Listing of Claims

Claim 1 (currently amended): A non-aqueous electrolyte secondary battery provided with a positive electrode capable of absorbing and desorbing lithium, a negative electrode capable of absorbing and desorbing lithium, and a non-aqueous electrolyte solution, wherein

a positive electrode active material in said positive electrode is a mixture of lithium-manganese composite oxide and ~~at least one of~~ lithium-nickel composite oxide represented by [[a]] the general formula $\text{LiNi}_a\text{M1}_{1-a}\text{O}_2$ $\text{LiNi}_c\text{Mn}_d\text{Co}_{1-d}\text{O}_2$ (wherein M1 denotes at least one element selected from B, Mg, Al, Ti, Mn, V, Fe, Co, Cu, Zn, Ga, Y, Zr, Nb, Mo, and In, and a relationship $0 < a \leq 1$ is the relationships $0 < c < 0.5$, $0.1 < d < 0.6$ are satisfied), and lithium-cobalt composite oxide represented by the general formula $\text{LiCo}_b\text{M2}_{1-b}\text{O}_2$ (wherein M2 denotes at least one element selected from B, Mg, Al, Ti, Mn, V, Fe, Ni, Cu, Zn, Ga, Y, Zr, Nb, Mo, and In, and the relationship $0 < b \leq 1$ is satisfied), and

said non-aqueous electrolyte solution contains at least a saturated cyclic carbonic acid ester and an unsaturated cyclic carbonic acid ester having double bond of carbon where content by amount of said unsaturated cyclic carbonic acid ester having double bond of carbon is in a range of 1.0×10^{-8} to 2.4×10^{-4} g per positive electrode capacity 1 mAh.

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Claim 2 (original): The non-aqueous electrolyte secondary battery according to claim 1,
wherein

 said lithium-manganese composite oxide has a spinel-type crystal structure.

Claim 3 (original): The non-aqueous electrolyte secondary battery according to claim 2,
wherein

 said lithium-manganese composite oxide is represented by the general formula $\text{Li}_{1+\epsilon}\text{Mn}_2\text{fM}_4\text{O}_4$ (wherein M4 denotes at least one element selected from B, Mg, Al, Ti, Mn, V, Fe, Co, Ni, Cu, Zn, Ga, Y, Zr, Nb, Mo, In, and Cr, and the relationships $0 \leq \epsilon \leq 0.5$, and $0 \leq f \leq 1$ are satisfied).

Claims 4-6 (cancelled)

Claim 7 (original): The non-aqueous electrolyte secondary battery according to claim 1,
wherein

 said unsaturated cyclic carbonic acid ester having double bond of carbon is vinylene carbonate.

Claim 8 (original): The non-aqueous electrolyte secondary battery according to claim 1,
wherein

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said non-aqueous electrolyte solution contains a chain carbonic acid ester in addition to the saturated cyclic carbonic acid ester and the unsaturated cyclic carbonic acid ester.

Claim 9 (original): The non-aqueous electrolyte secondary battery according to claim 1, wherein

negative electrode active material in said negative electrode is graphite.

Claim 10 (original): The non-aqueous electrolyte secondary battery according to claim 1, wherein

the negative electrode active material in said negative electrode is graphite coated with low crystalline carbon in which whole or a part of a surface of first graphite material as a substrate is coated with second carbon material which is lower in crystallinity compared with the first graphite material.

Claim 11 (original): The non-aqueous electrolyte secondary battery according to claim 10, wherein

said graphite coated with low crystalline carbon has an intensity ratio (IA/IB) which is an intensity IA of 1350/cm based on an intensity IB of 1580/cm, as measured by argon laser Raman, in a range of 0.2 to 0.3.